

USDA-Agricultural Research Service  
In cooperation with  
OSU/Ohio Agricultural Research and  
Development Center

## North Appalachian Experimental Watershed

Coshocton, Ohio



*An Outdoor Laboratory for Land and  
Water Management Research*

## Resource Overview

THE NAEW LOCATION INCLUDES:

- 1,050 acres
- 11 large lysimeters for ground water studies
- 22 instrumented watersheds for runoff research
- meteorological station and network of recording rain gauges
- long-term, experimental field sites

*plus*

- decades of data collection experience and data records
- state-of-the-art laboratory
- expansion capabilities

EXPERIENCED PERSONNEL:

Ph.D. Soil Scientists,  
Ph.D. Engineer, and  
Technicians with decades of research  
experience in the areas of:

- Watershed Management
- Non-Point Source Pollution and Abatement
- Improved Agricultural Management Practices
- Watershed Instrumentation

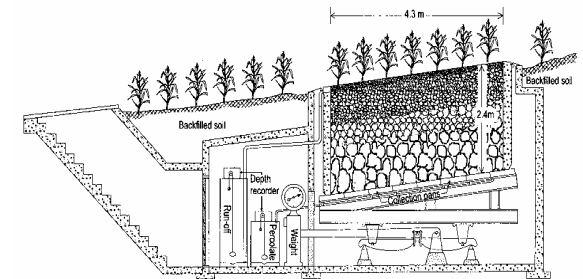
*Experimental Watershed*



## Physical Setting

The NAEW is near Coshocton in east central Ohio, an unglaciated portion of the state with rolling uplands. Underlying bedrock includes sandstone, shale, limestone, clay, and coal. Soils are medium textured and range from well-drained with no impeding soil horizon to soils that have a clay horizon. Average annual rainfall is 37.4 inches.

*Weighing Lysimeter for Ground  
Water Studies*



*H Flume and Coshocton Wheel for  
Surface Water Runoff Measurement*



The North Appalachian Experimental Watershed has always responded to the scientific research needs of the time. From soil erosion to hydrology to water quality concerns, the NAEW has always maintained its leadership at the cutting edge of field-based, environmental research.

The North Appalachian Experimental Watershed is one of only two hydrologic stations worldwide with over 60 years of continuous data collected from small watersheds and groundwater lysimeters. The station was opened in the mid 1930s to address soil erosion problems of the time. The Coshocton site was selected because it represented land conditions prevalent in many states in the Appalachian Region. Offices, laboratories, and field research equipment were built by Works Progress Administration (WPA) and Civilian Conservation Corps (CCC) labor.

In 1954 the NAEW was transferred to the newly formed Agricultural Research Service. In the 1960's, environmental awareness began growing rapidly. Agriculture's contribution to pollution of the land, water, and air needed to be identified and corrective measures developed. In 1966, research was started on the NAEW watersheds to determine how insecticides moved from cropland into streams.

Studies of the movement of plant nutrients in surface and subsurface waters were begun soon afterwards. Factors such as crop rotations, tillage tools, fertilization levels, and pasture grazing schemes were shown to affect nutrient losses. Studies have been conducted in surface-mined areas to evaluate the effects of surface mining on surface and groundwater hydrology, water quality, and erosion.

## The Research Program

### Current Research:

- Investigation of surface runoff production due to urbanization and agricultural practices on field-sized watersheds.
- Development of methods to characterize and simulate short-time increment precipitation.
- Develop new concepts and management practices that will enhance the quality, productivity, and sustainability of soil and water resources.
- Increase our understanding of the effects of agricultural management practices on carbon sequestration.

### Major Accomplishments:

- Development of no-till/conservation tillage practices that reduce runoff and erosion.
- Development of Coshocton wheel used worldwide for scientific sampling of surface water runoff.
- Understanding of macropore flow in the field and its impacts on nutrient and pesticide movement.
- Characterization of environmental impacts of coal surface mining.
- Evaluation of water quality under various pasture management schemes.
- Development of the curve number procedure for estimating runoff potential.

### New Research:

The North Appalachian Experimental Watershed (NAEW) is initiating a new research program to develop environmentally sound, economically viable land use practices for North Appalachia, including

- (1) Evaluation of best management practices (BMP's) and
- (2) Dairy grazing systems

The NAEW is unique. The research conducted here could not be done elsewhere in the world without a substantial capital investment. Benefits of the NAEW location include:

- Instrumented watersheds where the impacts of agriculture and other land uses can be measured under climatic and soil conditions typical of northern Appalachia
- Monolith lysimeters for simultaneously studying surface and ground water
- Historical, computerized data providing reference values for the past 60 years



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